

Comparison of Carvedilol to Propranolol in Reduction of Hepatic Venous Pressure Gradient in Liver Cirrhosis: A Meta-Analysis

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INTRODUCTION

- Nonselective beta-blockers (NSBBs) reduce portal pressures and have been used to reduce first decompensation and secondary prophylaxis for variceal bleeding.
- The effects of carvedilol and propranolol, the most commonly used beta blockers, on splanchnic and systemic hemodynamic parameters are not entirely understood.

METHODS

- Scientific databases of Publisher Medline, Excerpta Medica Database, Web of Science (WoS), and Cochrane Central Registry were searched from inception till June 2024
- Only double armed randomized controlled trials were included.
- Primary outcome:
 - Change in HVPG
- Secondary outcomes: Change in
 - Hepatic blood flow (HBF)
 - Mean Pulmonary Artery Pressure (MPAP)
 - MAP (Mean arterial pressure)
 - Systemic Vascular Resistance (SVR), and
 - Right Atrial Pressure (RAP).
- Outcomes were analyzed using the Mantel Haenszel method and reported in the form of extracted Mean Difference (MD) with 95% CI. The random effect model was employed for pooled studies.

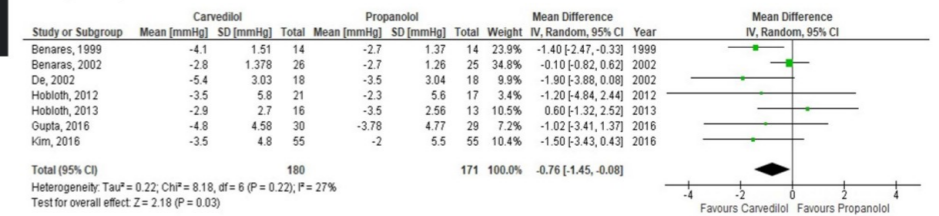
RESULTS

- Seven studies met the eligibility criteria and were included in the meta-analysis.
- Reduction in HVPG, SVR, and MAP was more significant in the carvedilol group compared to the propranolol group.
 - HVPG reduction (MD = -0.76, 95% CI= -1.45– -0.08; P = 0.03).
 - SVR reduction [(MD = -190.55, 95% CI= -307.5 – -73.58; P = 0.001).
 - MAP reduction (MD = -3.65, 95% CI= -5.94 – -1.36; P = 0.002).
- Decrease in cardiac output was greater in the propranolol group than in the carvedilol group.
 - CO reduction (MD= 0.92,95%CI= 0.45–1.38; P= 0.004)
- Decrease in hepatic blood flow (HBF) and right atrial pressure (RAP) were greater in the propranolol group; however, this did not reach statistical significance.
 - HBF reduction (MD= 0.13,95%CI= -0.06 – 0.32; P= 0.17).
 - RAP reduction (MD= 0.28,95%CI= -0.27– 0.83; P= 0.32).
- The decrease in mean pulmonary arterial pressure (MPAP) was greater in the carvedilol group; however, this was not statistically significant.
 - Decrease in MPAP (MD= -0.75,95%CI = -1.60– 0.10; P= 0.08).
- The incidence of rebleeding, shortness of breath, hepatic encephalopathy, and hypotension after initiation of therapy was not statistically different between the two groups.

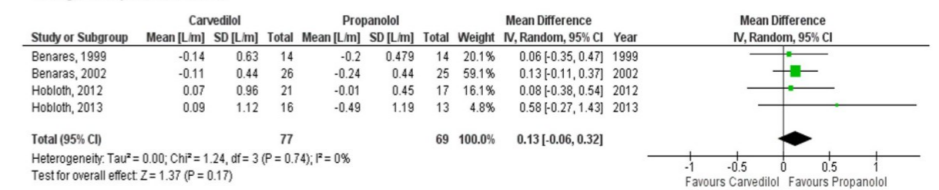
CONCLUSIONS

- Our meta-analysis comparing Carvedilol and propranolol in patients with decompensated cirrhosis demonstrated that Carvedilol significantly reduced HVPG compared to propranolol. Additionally, Carvedilol significantly lowered SVR and MAP.
- Overall incidence of adverse effects, including hypotension, hepatic encephalopathy, and shortness of breath, did not differ significantly between the two groups.

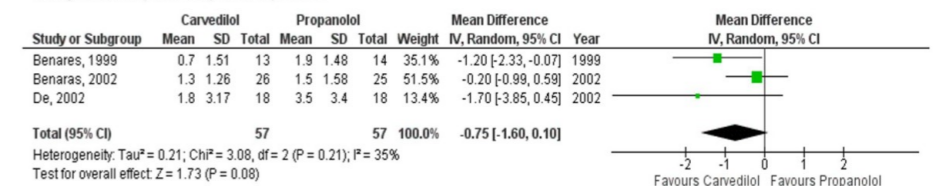
Change in Hepatic Venous Pressure Gradient



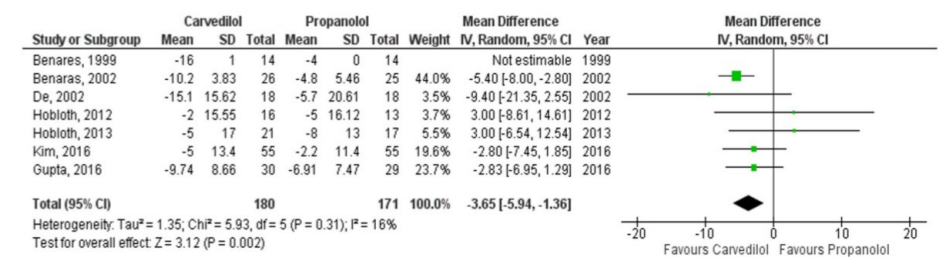
Change in Hepatic blood flow



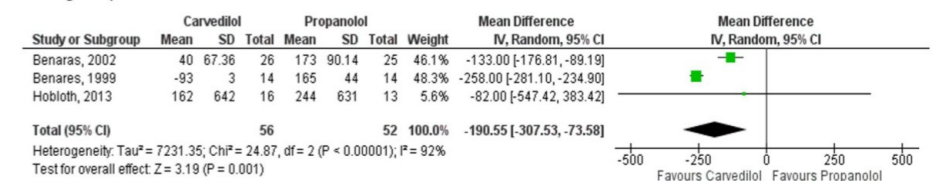
Change in Mean pulmonary arterial pressure



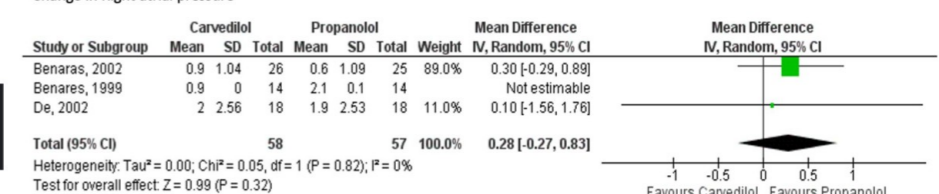
Change in Mean arterial pressure



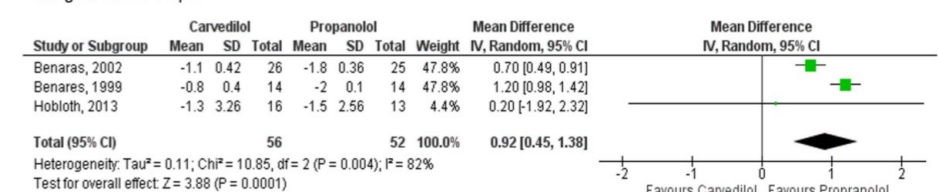
Change in Systemic vascular resistance



Change in Right atrial pressure



Change in Cardiac Output



Please scan QR code for PRISMA flow diagram, baseline characteristics, and references

